

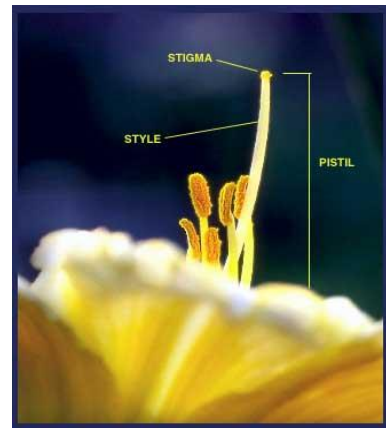
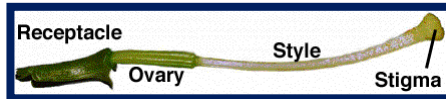
## Sexual Reproduction of a Plant

- All flowering plants reproduce **sexually**; the flower is the plant's reproductive organ.
- Some flowers, called perfect flowers (monoecious), are hermaphrodite, which means that they contain both male and female reproductive organs within the same flower; this is the most common flower.
- Some flowers, called imperfect flowers (pumpkin or melons), contain only male reproductive organs (pistillate) or female reproductive organs (staminate).
- Some plant species have both male and female flowers on the same plant, while others have only male flowers on some plants and only female flowers on others.
- In humans and other animals, the male and female can get together on their own, but this can be difficult for plants.
- Although a few plants can pollinate themselves (self-pollination), most need to be pollinated by other plants of the same species; this is called cross-pollination.
- Pollen from the male parts of one flower is delivered to the female parts of another flower with help from birds, bats, rain, wind and especially insects.
- Insects, birds, bats and other small mammals are attracted to plants by the bright colours of the flowers petals or by their scent, which tells them that there is nectar inside.
- Nectar is a sweet, sugary liquid produced by an organ inside the flower called the Nectary which is located at the base of the petals below the ovary or little pouches or sacks at other places within the flower.
- Insects and birds love nectar, especially bees, which turn the nectar into honey.
- The nectar is hidden deep inside the plant and as they climb all the way down into the flower to get the nectar the bees get covered with pollen from the anther (the plant's male sex cell).
- The bee deposits the pollen on the stigma (the tip of the female reproductive organ) in the next plant it goes into as it flies from plant to plant collecting nectar.
- Once deposited on the stigma, the pollen is transported down the style to the plant's ovary where it can come in contact with the female sex cell, the ovule; the result is a fertilized (pollinated) ovule, which develops first into a seed and then into a fruit.
- The plants that don't attract birds and bees have to depend on the wind (or even on raindrops) for pollination; these plants (angiosperms) are much less "showy" than plants that have to attract birds and insects. Their flowers usually have small petals, no nectar and no scent. But they do have large Anthers that hang down outside their flowers. This makes it easy for them to disperse their Pollen.
- Grasses and many food grains (including corn, wheat and rice) literally throw their Pollen to the wind when it comes time to reproduce. They release great clouds of Pollen in the hope that some of it will land where it is needed.
- No matter how an ovule gets fertilized, it immediately begins to divide into different cells. Each fertilized cell becomes a seed. Each seed contains both an embryo (developing plant) and a food source (called endosperm). The embryo and endosperm are covered by a tough, protective covering called a seed coat.
- The Ovary of a plant can contain one seed or many seeds. Ovaries filled with one or more fertilized seeds are called a fruit. As seeds develop within them, the walls of the Ovaries of plants often become fleshy, fragrant and attractive to animals (like us).
- An apple, for example, is the ripened ovary of an apple tree which contains apple seeds in its core.
- In nature, animals (like birds, deer and bear) come along and eat the fruit. The seeds in the fruit survive the animal's digestive process and eventually get deposited in its droppings which can take place a long way from where the fruit was originally eaten, spreading the seeds far and wide so new plants can grow.

## Female Reproductive Structures

- Carpal or pistil
- Female parts are collectively termed the gynoecium
- Produce eggs
- Composed of 3 parts, the stigma, style, and ovary
- Stigma is located at the top and may be sticky or have hairs to pollen grains landing there
- Style is a stalk-like connection between the stigma and the ovary
- Ovary is the enlarged base containing ovules with eggs

Gynoecium



hold

## Male Reproductive Structures

- Stamen
- Male parts are collectively termed the androecium
- Produce pollen
- Composed of 2 parts --- filament & anther (pollen sac)
- Anthers produce pollen grains containing sperm
- Filament is stalk-like & supports the pollen sacs



Information sourced from:

1. [https://etap.org/demo/grade7\\_science/lesson5/instruction4tutor.html](https://etap.org/demo/grade7_science/lesson5/instruction4tutor.html)
2. <http://schoolmediainteractive.com/view/object/clip/E8CD25BA21B05AFCE55C338F10BB16E5/06>
3. [http://www.biologyjunction.com/plant\\_reproduction.htm](http://www.biologyjunction.com/plant_reproduction.htm)

## Diagram of Sexual Reproduction of a Plant

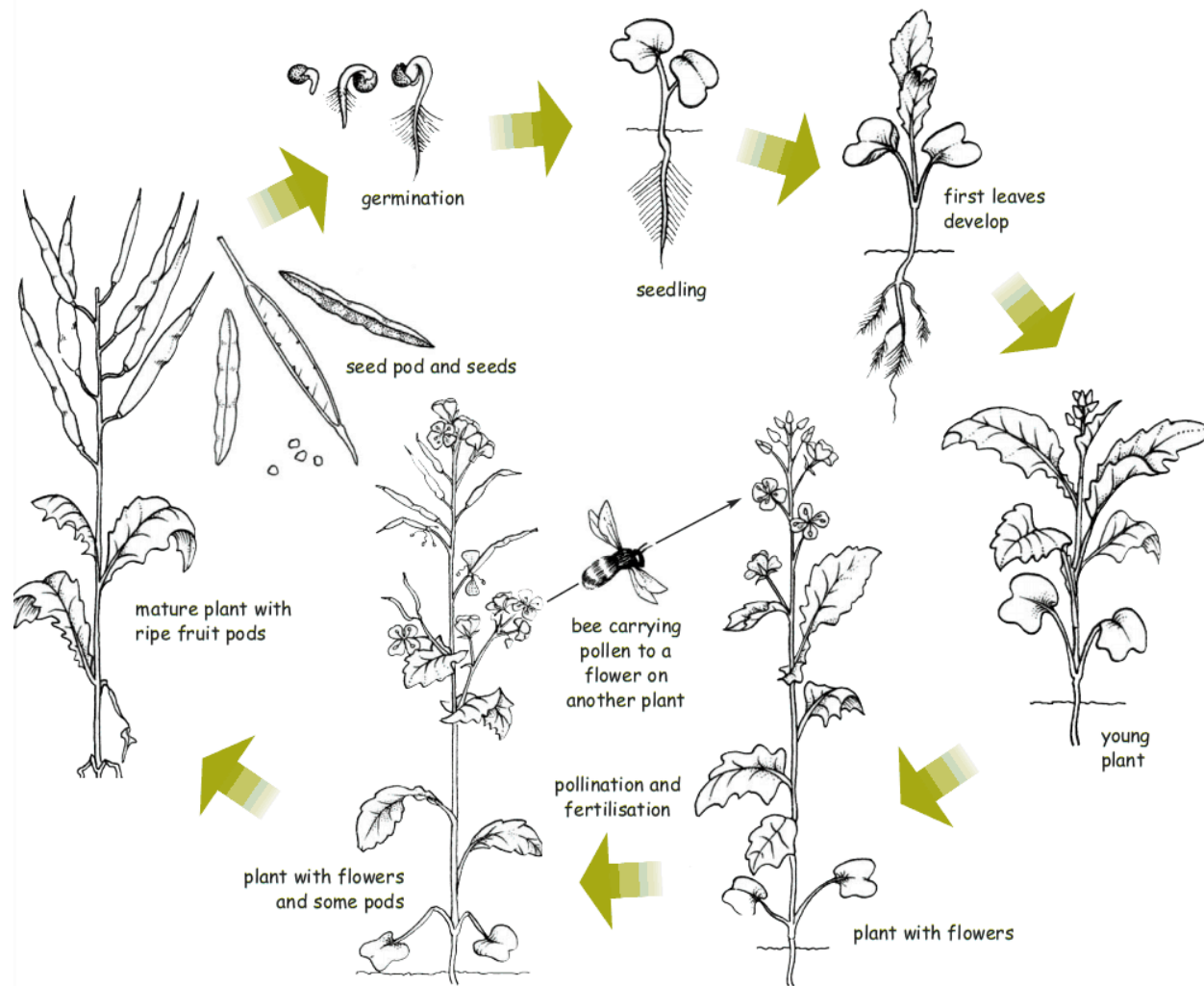


Image sourced from:

<http://www.mybookezz.org/ebook.php?u=aHR0cDovL3d3dy5zYXBzLm9yZy51ay9hdHRhY2htZW50cy9hcnRpY2xlLzlyNS9TQVBTJTlwLSUyMExpZmUIMjBDeWNsZSUyMG9mJTlwYSUyMEZsb3dlcmlyZyUyMFBsYW50LnBkZgpUaGUgbGlmZSBjeWNsZSBvZiBhIGZsb3dlcmlyZyBwbGFudA==>

### Asexual Reproduction

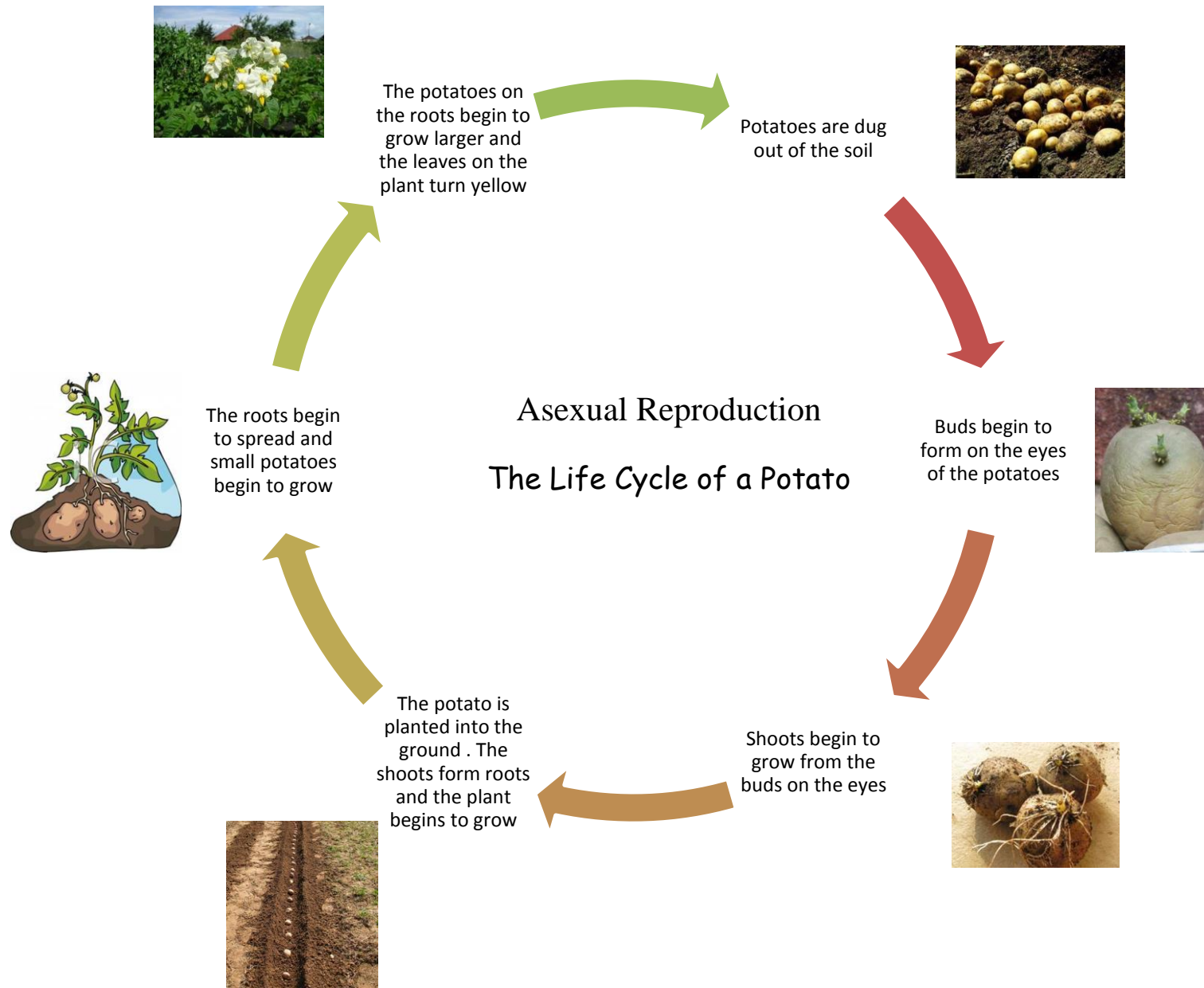
- does not involve male and female cells
- only one parent is needed
- occurs mostly in plants and bacteria
- rare in animals except in a few simple kinds like the worm

### Asexual Reproduction of a Plant

- Generally occurs in non-flowering plants such as ferns and mosses
- Many plants including food crops like onions, pineapple, potatoes and carrots reproduce asexually. Plants that produce asexually will be exactly the same.
- Some plants can reproduce asexually by sending out "runners" that take root wherever they touch the ground and they can also reproduce sexually with the help of their flowers. For example, strawberries.

### Types of Asexual Reproduction

Regeneration	Vegetative Propagation	Budding	Binary Fission	Gemmules	Sporulation
organism uses cell division to regrow body parts e.g. starfish, planaria, worms, plants, potatoes, lizards	occurs where a piece of a plant is cut off to produce a new plant that is genetically identical to the parent plant (a clone) e.g. strawberry plant, vegetables & crops	an organism starts to grow a new organism that eventually breaks away to live on its own e.g. hydra	occurs where an organism whose cells do not contain a nucleus, copy and then divide into two identical organisms e.g. bacteria, amoeba, paramecium	these are special structures found in sea sponges and once released, they later develop into mature sponges	occurs through the production and release of spores e.g fungi, ferns, mosses



	<b>Differences between Sexual and Asexual Reproduction</b>	
	<b>Sexual Reproduction</b>	<b>Asexual Reproduction</b>
<b>Number of Parents</b>	- 2 (1 male and 1 female)	- 1 (can be either male or female)
<b>Offspring</b>	- genetically different	- genetically identical to parent and other offspring
<b>Cell Division Process</b>	<ul style="list-style-type: none"> <li>- special cell division following nuclear division by meiosis producing sex cells called gametes</li> <li>- following fertilisation, subsequent divisions are normal</li> </ul>	- normal cell division following nuclear division by mitosis
<b>Advantages</b>	- variation in the offspring (process of evolution)	<ul style="list-style-type: none"> <li>- the process is quick</li> <li>- useful for farmers in order to ensure continuity of their fruit or vegetable</li> </ul>
<b>Disadvantages</b>	- the process required to bring together the gametes and to protect the zygote(fertilised ovum) and embryo during development is slow	- disease may affect all e.g. if the parent cell is affected by disease, this may continue throughout the cycle
<b>Life Cycle</b>	- reproduction may be timed to match with the end of the growing season	- particularly useful in ideal growing conditions

Sourced from [http://www.biotopics.co.uk/genes1/asexual\\_and\\_sexual\\_reproduction.html](http://www.biotopics.co.uk/genes1/asexual_and_sexual_reproduction.html)